

July 14, 1931.

H. GILES

1,814,795

VENDING MACHINE

Filed Aug. 1, 1929

5 Sheets-Sheet 1

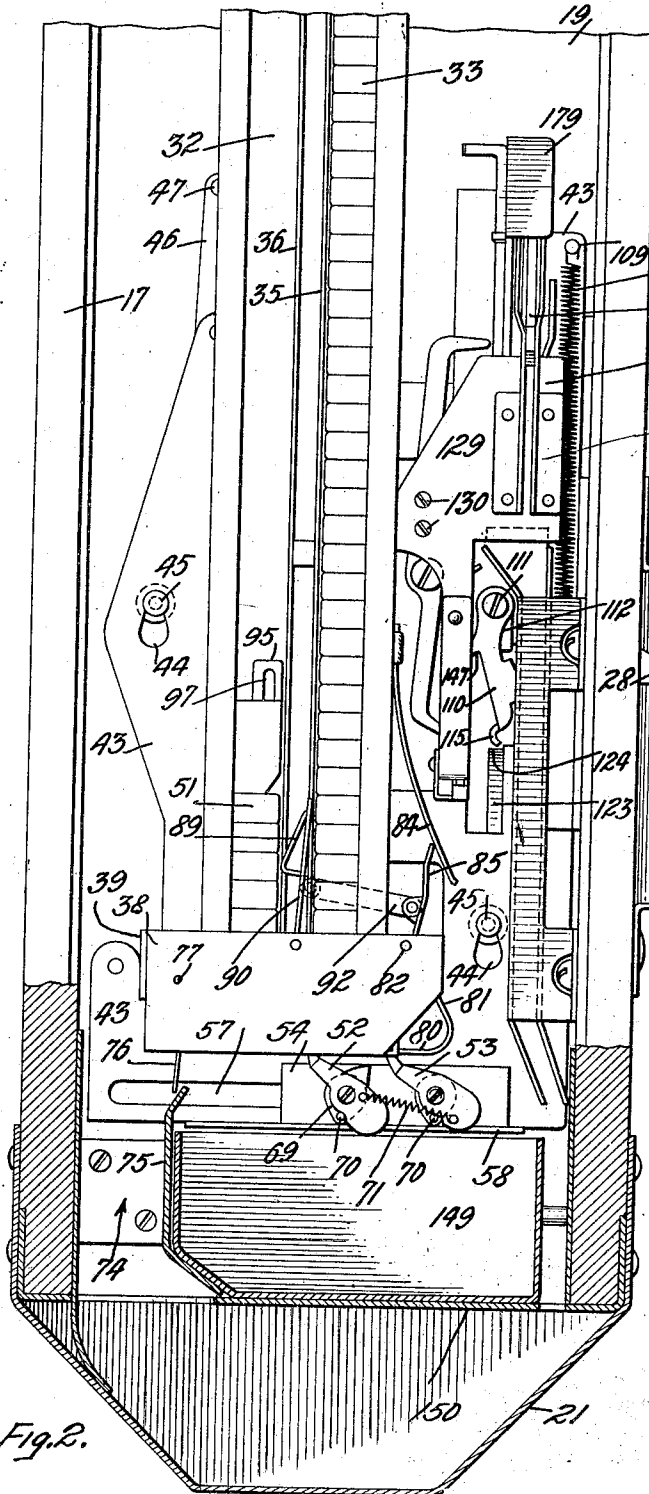


Fig. 2.

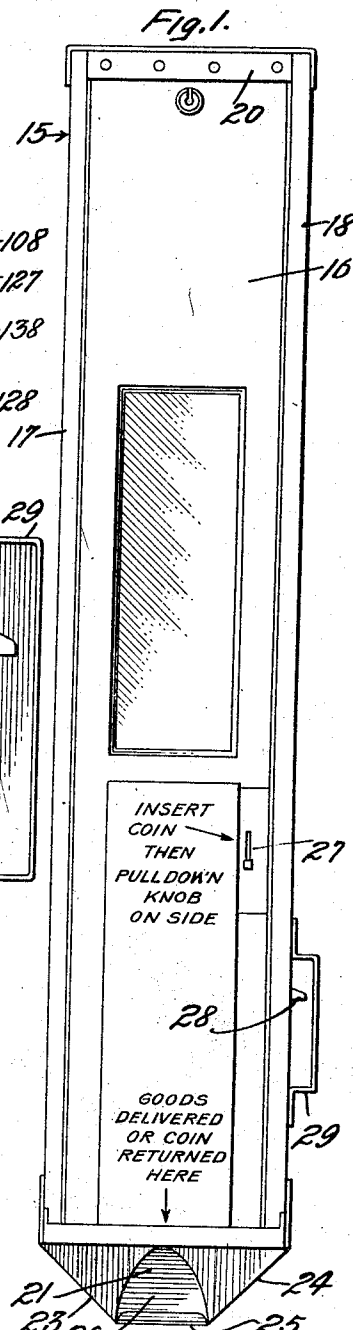


Fig. 1.

INVENTOR
HARVEY GILES
BY
Julian H. Smith
ATTORNEY

July 14, 1931.

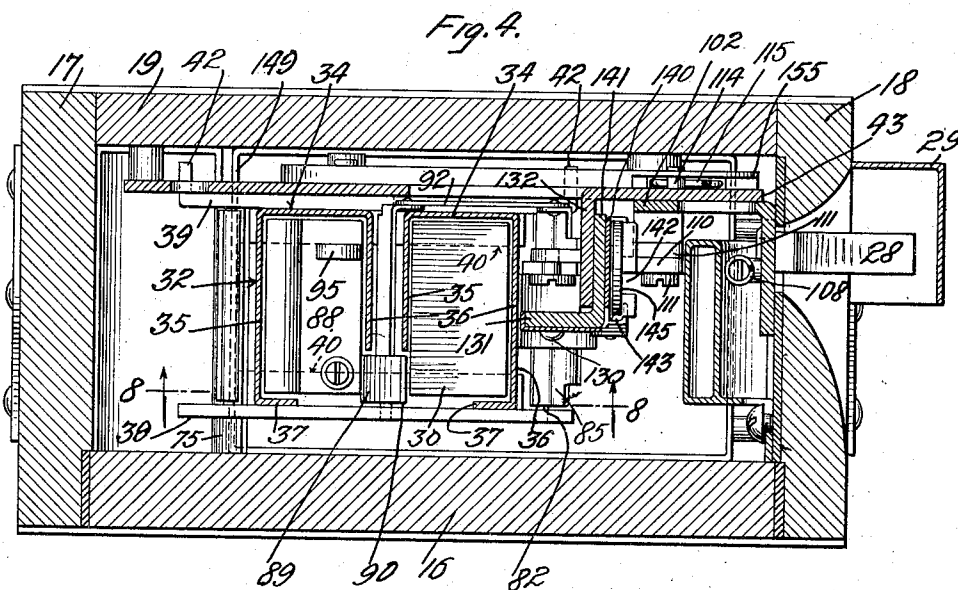
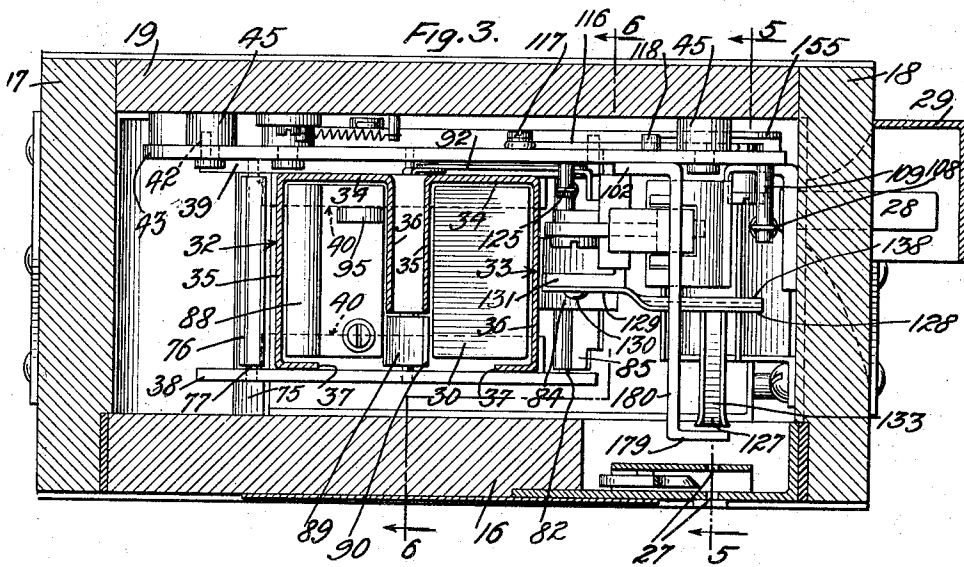
H. GILES

1,814,795

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5 Sheets-Sheet 2



INVENTOR
HARVEY GILES
BY
J. L. H. H. H. H.
ATTORNEY

July 14, 1931.

H. GILES

1,814,795

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5 Sheets-Sheet 3

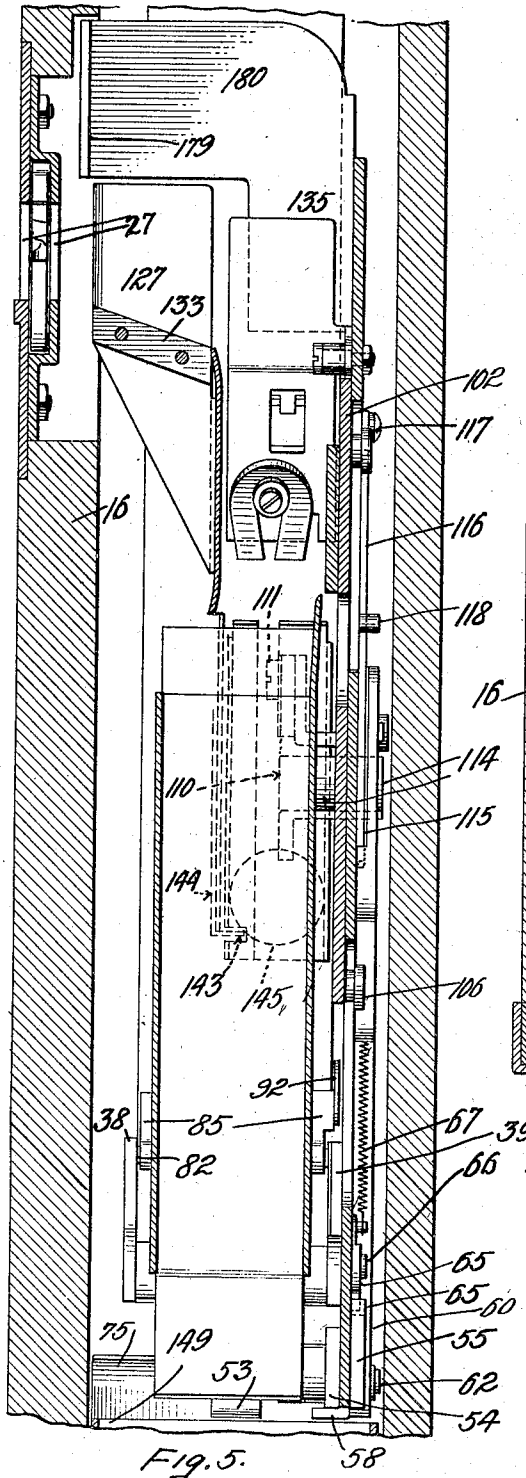


Fig. 5.

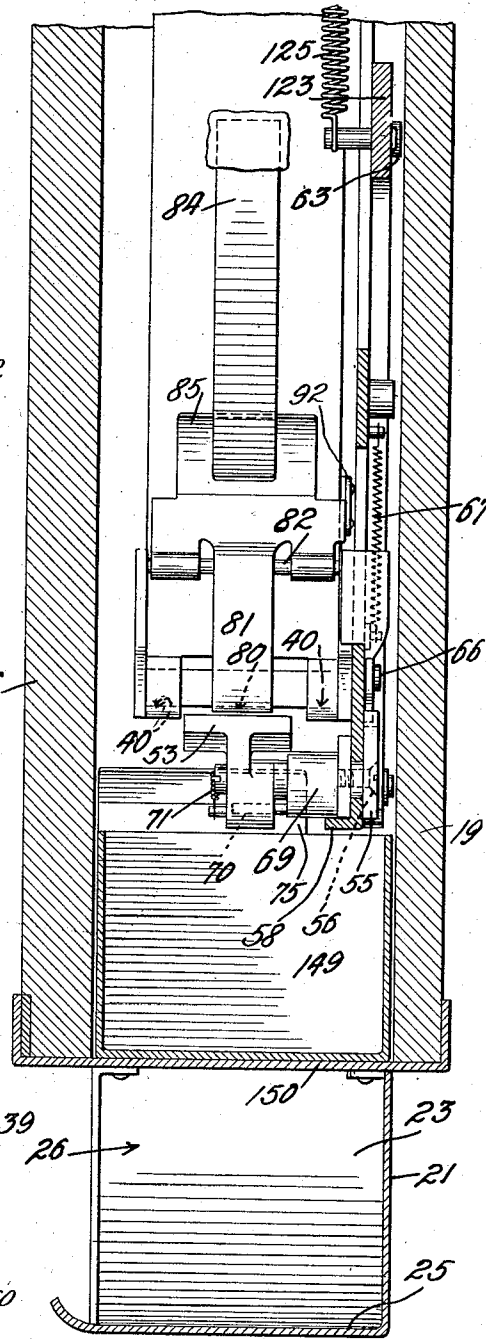


Fig. 6.

INVENTOR
HARVEY GILES
BY
Julius A. Smith
ATTORNEY

July 14, 1931.

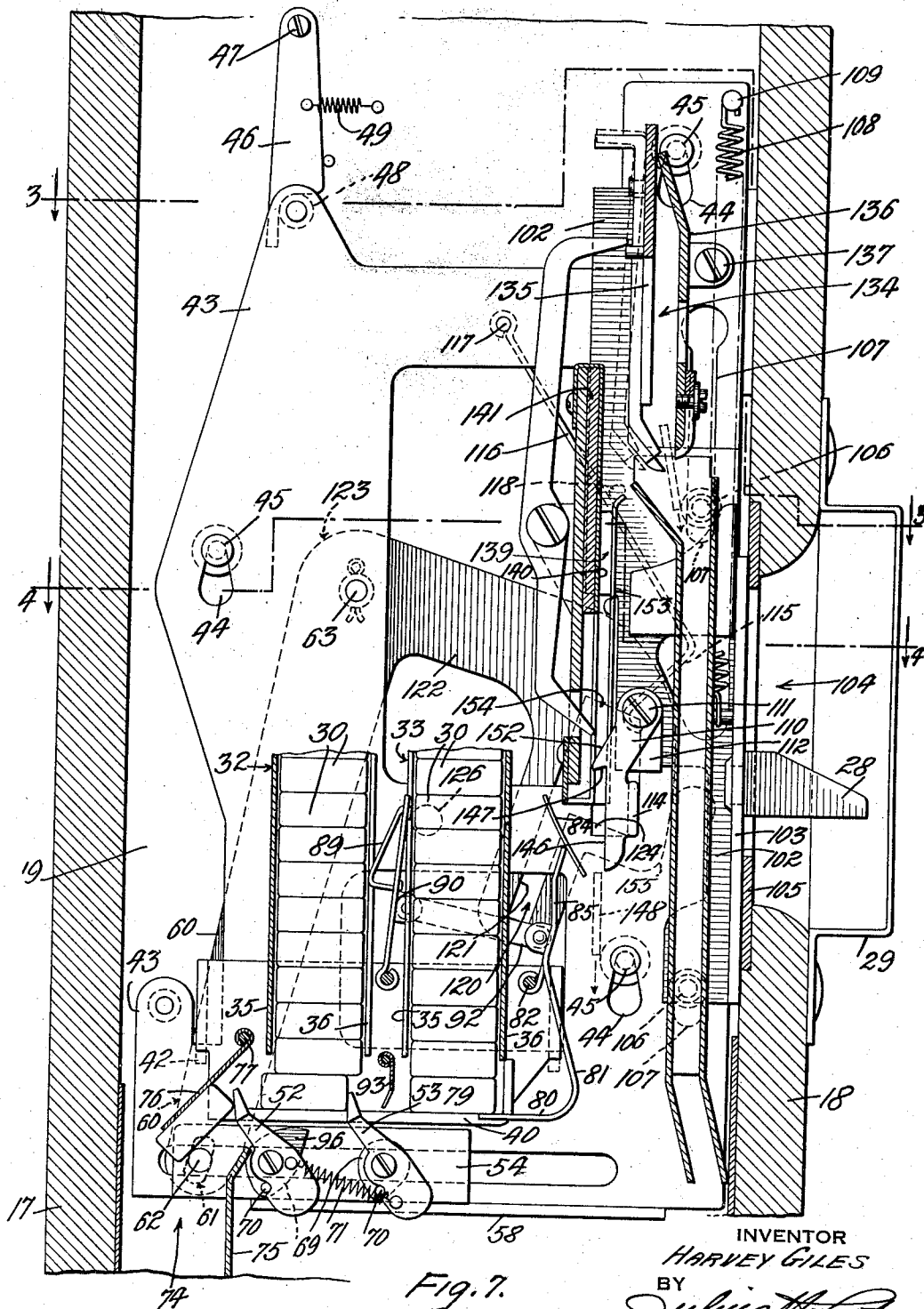
H. GILES

1,814,795

VENDING MACHINE

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5 Sheets-Sheet 4



INVENTOR

HARVEY GILES

BY

Julius H. Smith
ATTORNEY

ATTORNEY

July 14, 1931.

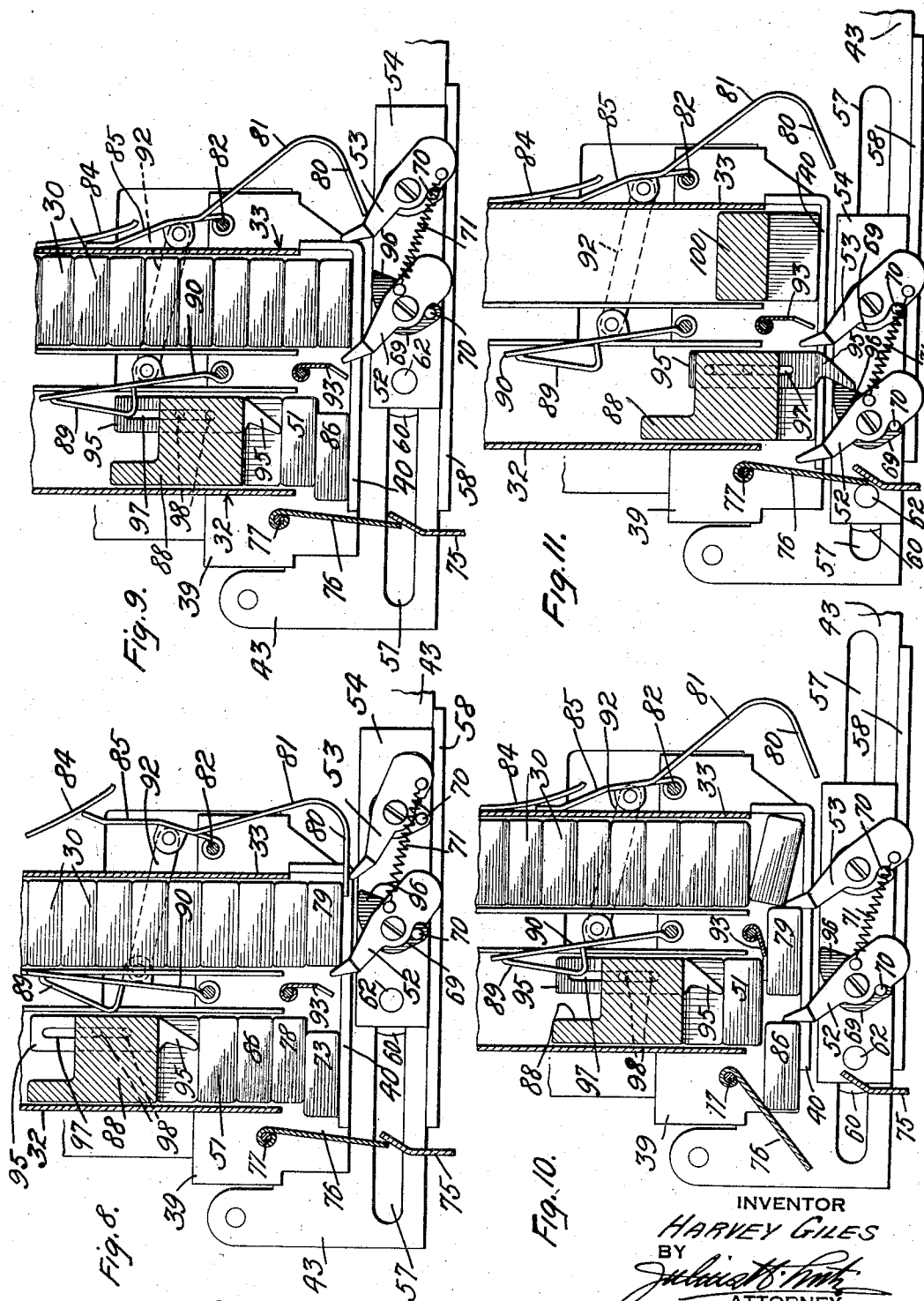
H. GILES

1,814,795

VENDING MACHINE

Filed Aug. 1, 1929

5 Sheets-Sheet 5



UNITED STATES PATENT OFFICE

HARVEY GILES, OF BROOKLYN, NEW YORK, ASSIGNOR TO ARTEMAS WARD INC., A CORPORATION OF DELAWARE

VENDING MACHINE

Original application filed January 23, 1928, Serial No. 248,829. Divided and this application filed August 1, 1929. Serial No. 382,670.

The invention relates to an improvement in vending machines of the type in which an article is delivered by the manipulation of a handle upon the insertion of a coin in the machine. The present application is a division of my copending application Serial No. 248,829, filed January 23, 1928.

The general object of the invention is to reorganize and simplify the operating parts of a coin-controlled vending machine to produce a more efficient and durable machine. A more specific object of the invention is to provide a vending machine in which the articles to be vended are stacked in columns with means for preventing frictional engagement between the articles of a reserve column or columns and the delivery means until the machine is in condition to deliver the articles from the reserve column. To the accomplishment of these objects the invention consists in the improved coin-controlled vending machine hereinafter fully described and particularly pointed out in the appended claims.

The preferred form of the invention is illustrated in the accompanying drawings in which Fig. 1 is a front elevation on a reduced scale of the box or casing of the machine; Fig. 2 is a front elevation, partly in section, of the lower part of the machine with the cover removed; Figs. 3 and 4 are transverse sections taken respectively on the lines 3—3 and 4—4 of Fig. 7; Figs. 5 and 6 are vertical sections taken respectively on the lines 5—5 and 6—6 of Fig. 3, and looking in the direction of the arrows; Fig. 7 is a front sectional elevation of the operating parts of the machine and showing the parts in the act of delivering an article; Fig. 8 is a section taken on the line 8—8 of Fig. 4, and showing more particularly the article delivery means; and Figs. 9, 10 and 11 are sections similar to Fig. 8 and showing the parts in different positions of operation.

The coin-controlled article delivery means of the vending machine are housed in a vertically arranged box or casing 15 rectangular in cross-section and consisting of the front wall or cover 16, the side walls 17 and 18 and the rear wall 19. The top of the casing is closed by the cover 20 and access into the

lower part of the casing is prevented by the hopper shaped enclosure 21 which serves as a receptacle into which the articles and returned coins are delivered. The slanting side walls 23 and 24 of the receptacle direct the articles and the returned coins onto the bottom 25 of the receptacle to which access is afforded through the opening 26 cut in the front wall of the receptacle. The coin is inserted in the slot 27 and an article is delivered by depressing the knob or handle 28 projecting through the side wall 18 and protected by the guard 29.

The articles 30 to be vended are in the present instance rectangular in form and are stacked in columns contained within the vertically arranged hoppers 32 and 33. In the illustrated embodiment of the invention the improved article delivery means and the actuating means therefor are shown associated with and operating on only two columns of articles. It will be understood, however, that the mechanism of the present invention is adapted to deliver articles from any desired number of columns simply by duplicating the parts of the article delivery means herein shown and described. Each hopper 32 and 33 consists of a rear wall 34, the left hand side wall 35, the right hand side wall 36, and the partial front wall 37. The vertically extending openings left in the front walls of the hoppers permit adjustment of the articles in the hoppers. At their lower ends the rear walls 34 of the hoppers are secured to a plate 38, and the lower ends of the partial front walls 37 are secured to a plate 39. Projecting inwardly from the lower edge of each plate 39 and 38 is a narrow ledge or shelf 40. The outer bottom edges of the lowermost articles in the hoppers rest on the shelves 40 and the articles are thus supported in the hoppers. The lower ends of the walls forming the hoppers terminate above the shelves 40 a distance sufficient to permit the articles resting on the shelves to be ejected from the machine.

The hoppers 32 and 33 are supported in upright position within the casing 15 in the usual manner and for this purpose the ends

of the plate 38 are provided with the rearwardly and downwardly projecting hooks 42 which engage with the edges of openings in a plate 43 removably mounted on the rear wall 19 of the casing. The plate 43 is provided with three slots 44, two on its right side and one on its left, which are adapted to receive the headed pins 45 extending forwardly from the casing wall 19. The upper ends of the slots are contracted to receive the neck portion of the pins 45, whereas the heads of the pins engage with the front face of the plate which is thus held from shifting. The pins 45 also serve to keep the rear face of the plate 43 properly spaced from the wall 19. The plate 43 is locked in place by means of an arm 46 pivoted at 47 on the casing wall 19. The lower end of the arm 46 is notched to engage with a pin 48 projecting rearwardly from the upper part of the plate 43, and thereby prevent the plate 43 from accidentally lifting out of place. A spring 49 holds the notched lower end of the arm 46 in engagement with the pin 48.

The improved article delivery means is arranged to deliver first all the articles in hopper 32 except the last or topmost article 51 therein, then to deliver all the articles in hopper 33, and finally to deliver article 51, after which the machine is locked against further operation until again replenished with articles. The article delivery means comprises the two fingers 52 and 53 pivoted on a slide 54 mounted on the front side of the lower end of the plate 43. On the rear side of the plate 43 and located opposite the slide 54 is a rack plate 55 which is secured to the slide 54 by screws 56 passing through the longitudinal slot 57 cut in the plate 43. The lower edge of the slide 54 is supported on a ledge 58 offset forwardly from the lower edge of the plate 43. Reciprocating movements are imparted to the slide 54 by a lever arm 60 the lower slotted end 61 of which loosely engages a pin 62 projecting rearwardly through the slot 57 from the left hand end of the slide. The lever arm 60 is fulcrumed at 63 on the rear side of the plate 43 and is actuated by the handle 28 in the manner to be described presently. To prevent return movement of the slide 54 before it has completed a full article delivery stroke, the upper edge of the plate 55 is provided with the teeth 64 arranged to be engaged by a pawl 65 pivoted at 66 on the rear side of the plate 43. The pawl 65 is controlled by a spring 67.

The fingers 52 and 53 are held spaced on the slide 54 by the collars 69 so that the upper ends of the fingers may extend into the space between the shelves 40 to engage and eject the articles. The operative article delivering position of the fingers is determined by the stop pins 70 projecting forwardly from the collars 69 and against which the spring 71 yieldingly holds the fingers. These parts are

arranged and function as usual in machines of this character.

The normal retracted position of the slide 54 is shown in Fig. 8. As the slide is moved to the left the upper end of the finger 52 engages the lowermost article 73 of the hopper 32 and pushes it out from under the column of articles in the hopper and beyond the left hand ends of the shelves 40 (the action being indicated in Fig. 7), so that the article will fall down through the opening 74 formed between the inner surface of the lower end of the wall 17 and the guide plate 75 secured to the rear wall 19 of the casing and projecting forwardly therefrom. The opening 74 discharges into the receptacle 21. As the article is moved outwardly by the finger 52 it swings the flap or guard 76 pivoted at 77 on the plates 38 and 39. The flap 76 acts to prevent the insertion of an instrument into the machine to abstract an article therefrom. As soon as the finger 52 has pushed the lowermost article 73 out from under the superincumbent articles in the hopper 32 the next succeeding article 78 drops onto the shelves 40. As the slide 54 returns to its initial position the spring 71 permits the upper end of the finger 52 to pass under the article on the shelves 40 and then returns it to article engaging position after it has passed to the right of the article. This mode of operation is continued until all the articles except the last or topmost article 51 are delivered from the hopper 32.

While all the articles except the last two articles are being delivered from the hopper 32 by the finger 52, the finger 53 is passing inoperatively under the articles in the hopper 33, being prevented from engaging the lowermost article 79 in hopper 33 by the intumed lower end 80 of a guard 81 pivoted at 82 on the right hand ends of the plates 38 and 39. Fig. 7 shows the limit of the left hand movement of the finger 53 and Figs. 8 and 9 show the right hand limit of the movement of the finger 53. Thus it is seen that while the end 80 of the guard 81 is under the articles in the hopper 33 the finger 53 reciprocates inoperatively, except to push forward slightly the lowermost article of the column in the hopper 32. This condition continues until only two articles remain of the column in hopper 32, the last or topmost article 51 and the next lower article 86, as shown in Fig. 9. This arrangement prevents any frictional engagement between the finger 53 and the articles in reserve column 33 until the machine is in condition to deliver the articles of column 33.

The delivery of all the articles from hopper 32 except the last two therein lowers the weight 88 resting on the column of articles in the hopper below a feeler member 89 projecting into the slotted lower end of the side wall 36 of hopper 32 from the upper end of an arm 90 pivoted at its lower end in the up-

per edges of the plates 38 and 39. The arm 90 is connected by the link 92 with the upper extension 85 of the guard 81. Until the last two articles in the hopper 32 have been delivered the leaf spring 84 acting on the extension 85 of the guard 81 presses the feeler member 89 against the adjacent sides of the articles and of the weight 88. When, however, only two articles remain in the column of hopper 32 the weight 88 descends below the feeler member 89, and thereupon the spring 84 acts to swing the arm 90 and the upward extension 85 of the guard 81 to the left and thereby retract the extension 80 of the guard 81 from beneath the column of articles in hopper 33. This permits the upper end of the finger 53 to assume a position behind the lowermost article 79 in hopper 33. On the next left hand movement of the slide 54 the finger 52 engages and pushes out of the machine the second last article 86 of column 32 and the finger 53 pushes the lowermost article 79 of hopper 33 into the place occupied by article 86. This mode of operation is clearly indicated in Fig. 10. To prevent article 79 from frictionally engaging the bottom surface of article 51 in hopper 32, I provide a flap 93 depending in the path of travel of the articles being delivered from hopper 33. As an article is pushed forward by finger 53 it engages the flap 93 and swings it under the adjacent side edge of article 51. When the article pushed forward by finger 53 has displaced the article under article 51 in hopper 32 the flap 93 returns to inoperative position. The lower end of the flap is slotted so as not to interfere with the passage of the upper ends of the fingers.

The finger 53 continues in this manner to deliver the articles from hopper 33 until all the articles therein have been delivered. When the last article in hopper 33 has been pushed forward by finger 53 and delivered from the machine by finger 52, the last article 51 in hopper 32 descends onto the shelves 40 in position to be engaged and delivered by finger 52. While finger 52 is pushing the last article 51 out of the machine the vertically arranged detent 95 loosely mounted in weight 88 descends into the path of return movement of the lug 96 projecting upwardly from the collar 69 associated with finger 52, thereby preventing return movement of the slide 54. The lower end of detent 95 normally rests on the last article 51 in hopper 32, as clearly indicated in Figs. 8 to 10. When article 51 has been delivered detent 95 drops of its own weight into the path of travel of lug 96. The detent 95 is provided with a slot 97 which engages the pins 98 passing through the weight 88. The articles are pressed downwardly in the hopper 33 by means of the weight 100. The lower ends of both weights 88 and 100 are slotted so that

they press only on the two ends of the uppermost articles in the hoppers.

The means for actuating the lever arm 60 to reciprocate the slide 54 comprises a vertically arranged slide 102 slidably mounted on the front face of the right hand margin of the plate 43 the outer edge of which is straight and lies closely adjacent to the inner face of the side wall 18 of the casing. A portion of the right hand edge of the slide 102 is offset forwardly, and to the middle to this offset part 103 of the slide 102 is secured the knob or handle 28. To protect the edges of the slot 104 in the side wall 18 of the casing through which the handle 28 projects, a slotted plate 105 is provided against which the part 103 of the slide 102 reciprocates. Extending rearwardly from the slide 102 are two headed pins 106 which project through the vertically arranged slots 107 in the plate 43. The slide 102 is thus guided in its up and down movements and the heads of the pins by engagement with the rear face of the edges of the slots 107 hold the slide 102 and the parts carried by it in operative position. The slide 102 is moved downwardly to impart a left hand, article delivering movement to the slide 54 through the lever arm 60 by depressing the handle 28 when a coin is in proper position in the machine. The slide 102 is returned to its raised position by means of the contraction spring 108 secured at its upper end to the pin 109 fastened in the upper end of the plate 43 and secured at its lower end in the part 103 of the slide 102. The means for operatively connecting the slide 102 with the lever arm 60 when a coin is in proper position in the machine comprises a member 110 pivotally mounted at 111 on the slide 102. A block 112 holds the member 110 away from the slide 102. The member 110 is provided on its right hand side with a rearwardly extending arm 114 which projects through an opening in the plate 43 and has a normal position above a deflector 115 formed as the inclined lower end of a resilient member 116 secured at its upper end 117 to the upper part of the rear side of the plate 43. A pin 118 normally holds the lower end 115 of the member 116 in deflecting position. If the handle 28 is depressed when no coin is in the machine the arm 114 of the member 110 slides down the deflector 115 and is guided thereby into the vertically arranged slot 120 formed in the downwardly extending part 121 of the lever arm 122, which with the lever arm 60 constitutes a bell crank lever 123 pivoted at 63. Thus there is no engagement between the arm 114 and the lever 123 when no coin has been deposited in the machine and consequently the handle 28 may be depressed without affecting the other parts of the machine beyond inoperatively reciprocating the slide 102 and the parts car-

ried by it. When, however, a proper coin has been inserted in the machine, the downward movement of the arm 114 pushes aside the deflector 115 and engages with the shoulder 124 formed on the part 121 of the lever arm 122 and oscillates the lever 123 about its pivot point 63 to move the slide 54. The lever 123 is returned to normal position by means of the spring 125 secured at its upper end to the plate 43 and at its lower end to the lever arm 122. A stop 126 on the plate 43 engaged by the lever arm 60 determines the normal position of lever 123.

When a coin is inserted into the machine through the slot 27 it passes into a guide slot 127 formed by the upper bifurcated ends of a fixture 128 fastened to the plate 129 secured by the screws 130 to the angle iron 131 supported by the offset part 132 of the right hand margin of the plate 43. The incoming coin is guided by the slot 127, the bottom 133 thereof being inclined for the purpose, into the opening 134 formed between the flange 135 extending forwardly from the upper end of the slide 102 and the coin deflector 136 pivoted at 137 in the upper part of the right hand margin of the plate 43. The plate 43 constitutes the rear wall of the opening 134 and the side extension 138 of plate 129 constitutes the front wall thereof. The lower end of the coin deflector 136 is inclined slightly to the left, when the parts are in normal position, and directs the coin into the upper end of a vertically arranged pocket 139, the side 140 of which is secured to the part 141 of the angle iron 131. At its two lateral edges the side 140 of the pocket 139 is extended at right angles and then inwardly, thereby forming a receptacle open at its upper and lower ends and provided on its right hand side with a vertical opening 142 to permit the member 110 to feel for and engage the coin in the pocket. As the falling coin reaches the lower end of the pocket 139 it is caught and held by the rearwardly turned lower end 143 of a resilient member 144 secured to the lower end of the plate 129. The coin 145 in the lower end of the pocket 139 is held by the resilient member 144 in position to be engaged by the lower end 146 of the member 110 as the latter is swung in a clockwise direction by reason of the engagement of the arm 114 with the deflector 115. When the lower end 146 of the member 110 encounters the coin 145 the member 110 is held against further pivotal movement, and the arm 114 is thereby held in a vertical plane over the shoulder 124 of the lever arm 122. Consequently, on the continued downward travel of the member 110 with the handle 28, the arm 114 pushes to one side the deflector 115 and engages with the shoulder 124, thereby oscillating the lever 123 on its pivot point 63 and moving the slide 54 to deliver an article. On the continued downward movement of the member 110 the shoulder

147 formed on the left hand edge of the member 110 engages with the upper edge of the coin 145 and forces it out of the lower end of the pocket 139 against the action of the resilient member 144. The released coin drops, as indicated by the dotted lines 148 in Fig. 7, and is received in the coin box 149 supported on the top wall 150 of the receptacle 21. On the upward return movement of the member 110, the upper edge 152 of the shoulder 147 encounters the part 153 of the right hand side wall of the pocket 139 which acts as a cam to rotate the member 110 in a counter clockwise direction and position the arm 114 above the deflector 115. The top edge 154 of the opening in the lever arm 122 acts as a stop to limit the upward movement of the member 110 and the parts connected therewith. The side wall 155 of the lever arm 122 by engagement with the arm 114 as the latter slides on the shoulder 124 limits the oscillatory movement of the lever 123 and thereby the extent of the article delivery movement of the slide 54. Upon the delivery of the last article 51 of hopper 32 by finger 52, and the locking of slide 54 by the engagement of the lug 96 by the detent 95 the coin slot 127 is closed by the guard plate 179 which prevents the insertion of any more coins into the machine. The guard plate 179 is carried by the forwardly extending part 180 of the upper end of the flange 135.

What I claim is new and desire to secure by Letters Patent is:—

1. In a vending machine of the character described, a plurality of vertically arranged hoppers for containing the articles to be vended, a pair of spaced shelves located below the hoppers and on which the lowermost articles in the hoppers rest, a slide arranged to reciprocate beneath the hoppers, a plurality of fingers pivotally mounted on the slide, there being one finger corresponding to each hopper, a guard member arranged under the articles of one hopper to prevent engagement therewith by the finger corresponding to that hopper while the articles are being delivered from the preceding hopper, and spring pressed feeler means for engaging with the articles in the preceding hopper until they have been exhausted to a predetermined extent for holding the guard under the articles in its hopper, the exhaustion of the articles in the preceding hopper to a predetermined extent permitting the feeler to move the guard from under the articles in its hopper.

2. In a vending machine of the character described having a reciprocatory slide and a plurality of fingers mounted on the slide for delivering articles, a plurality of vertically arranged hoppers for containing the articles to be vended, each finger on the slide corresponding to a hopper to prevent engagement therewith by the finger corresponding to that

hopper until the articles of the preceding
hopper have been delivered to a predeter-
mined extent, a pivoted feeler member con-
nected with the guard, a spring for forcing
the feeler member into contact with the ar-
ticles in its hopper, the engagement of the
feeler member by the articles holding the
guard under the articles in its hopper, ex-
haustion of the articles in the preceding
hopper below a predetermined point per-
mitting the spring to move the feeler mem-
ber and withdraw the guard from under the
articles in its hopper.

3. In a vending machine of the character
described having article delivery means con-
sisting of a slide, and a plurality of article
engaging fingers mounted on the slide, a
plurality of vertically arranged hoppers con-
taining the articles to be vended, there being
one finger corresponding to each hopper, a
feeler member for engaging the articles in a
hopper until they have been exhausted to a
predetermined extent, a guard held by the
feeler member under the articles in the next
succeeding hopper to prevent engagement
therewith by the finger corresponding to that
hopper, and means effective when the articles
in the first hopper have been exhausted to a
predetermined extent to move the feeler
member and retract the guard from under
the articles in its hopper.

4. In a vending machine of the character
described having article delivery means con-
sisting of a slide and a plurality of article
engaging fingers mounted on the slide, a plu-
rality of vertically arranged hoppers for con-
taining the articles to be vended, each hopper
corresponding to a finger, a pivoted guard
located under the articles in one hopper to
prevent engagement therewith by the fin-
ger corresponding to that hopper, a pivotally
mounted feeler member connected with the
guard and arranged to contact with the
articles in the preceding hopper to hold the
guard in operative position, and a spring for
pressing the feeler member against the arti-
cles in its hopper, exhaustion of the articles
in the hopper to a predetermined extent per-
mitting the spring to move the feeler member
and withdraw the guard from under the ar-
ticles in its hopper.

5. In a vending machine of the character
described, a plurality of vertically positioned
hoppers arranged in a file, said hoppers being
adapted to contain the articles to be vended,
article delivery means including a recipro-
catory slide located under the hoppers and
having article-engaging fingers, there being
one finger for each hopper and means for
preventing the fingers corresponding to the
rearmost hoppers from contacting with the
articles in said rearmost hoppers until the
finger corresponding to the foremost hopper
has delivered a predetermined number of ar-
ticles from the foremost hopper.

6. In a vending machine of the character
described having article delivery means in-
cluding a plurality of article-engaging fin-
gers, a plurality of vertically-positioned hop-
pers arranged in a file, there being a finger
corresponding to each hopper, a feeler mem-
ber for engaging the articles in a hopper to
determine when they have been exhausted to
a predetermined extent, a guard held by the
feeler member under the articles in the next
succeeding hopper, and means effective when
the articles in the first hopper have been ex-
hausted to a predetermined extent to move
the feeler member and retract the guard from
under the articles in its hopper.

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